Part 1

All Mining Team members

Definitions:
Sec. 63201

(h) "**Mining area**" means an area of land from which earth material is removed in connection with nonferrous metallic mineral mining, the lands on which material from that mining is stored or deposited, the **lands on which beneficiating or treatment plants and auxiliary facilities are located, the lands on which the water reservoirs used in the nonferrous metallic mineral mining process are located, and auxiliary lands that are used in connection with the mining.**

R 425.102
Rule 102. (1) (e) "**Beneficiation**" means the primary treatment of ore to separate or remove a metallic product or products from ore using a process including, but not limited to, any of the following:

(i) Crushing.

(ii) Grinding.

(iii) Washing.

(iv) Dissolution.

(v) Crystallization.

(vi) Filtration.

(vii) Sorting.

(viii) Sizing.

(ix) Drying.

(x) Sintering.

(xi) Pelletizing.

(xii) Briquetting.

(xiii) Calcining to remove water and/or carbon dioxide.

(xiv) Roasting, autoclaving, and/or chlorination in preparation for leaching (except where this process produces a final or intermediate product that does not undergo further beneficiation or processing).

(xv) Gravity concentration.

(xvi) Magnetic separation.

(xvii) Electrostatic separation.

(xviii) Flotation.

(xix) Ion exchange.

(xx) Ex situ solvent extraction.

(xxi) Electrowinning.

(xxii) Precipitation.

(xxiii) Amalgamation.

(xxiv) Heap, dump, vat, and tank leaching.

324.63205 Mining permit; application procedure.

Sec. 63205.
(1) A person shall not engage in the mining of nonferrous metallic minerals except as authorized in a mining permit issued by the department.

(2) An application for a mining permit shall be submitted to the department in a format to be developed by the department. The application shall be accompanied by all of the following:

(a) A permit application fee of $5,000.00. The department shall forward all permit application fees received under this section to the state treasurer for deposit in the fund.

(b) An environmental impact assessment for the proposed mining

operation that describes the natural and human-made features, including, but not limited to, flora, fauna, hydrology, geology, and geochemistry, and baseline conditions in the proposed mining area and the affected area that may be impacted by the mining, and the potential impacts on those features from the proposed mining operation. The environmental impact assessment shall define the affected area and shall address feasible and prudent alternatives.

(c) A mining, reclamation, and environmental protection plan for the proposed mining operation, including beneficiation operations, that will reasonably minimize the actual and potential adverse impacts on natural resources, the environment, and public health and safety within the mining area and the affected area. The plan shall address the unique issues associated with nonferrous metallic mining and shall include all of the following:

(i) A description of materials, methods, and techniques that will be utilized.

(ii) Information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings.

(iii) Plans and schedules for interim and final reclamation of the mining area following cessation of mining operations.

(iv) A description of the geochemistry of the ore, waste rock, overburden, peripheral rock, and tailings, including characterization of leachability and reactivity.

(v) Provisions for the prevention, control, and monitoring of acid-forming waste products and other waste products from the mining process so as to prevent leaching into groundwater or runoff into surface water.

(d) A contingency plan that includes an assessment of the risk to the environment or public health and safety associated with potential significant incidents or failures and describes the operator's notification and response plans. When the application is submitted to the department, the applicant shall provide a copy of the contingency plan to each emergency management coordinator having jurisdiction over the affected area.

(e) Financial assurance as described in section 63211.

(f) A list of other state and federal permits that are anticipated to be required.

(3) The applicant has the burden of establishing that the terms and conditions set forth in the permit application; mining, reclamation, and environmental protection plan; and environmental impact assessment will result in a mining operation that reasonably minimizes actual or potential adverse impacts on air, water, and other natural resources and meets the requirements of this act.

R 425.201 Permits

(5) The department may impose terms and conditions in a mining permit, in addition to those specified in the application, that are necessary to implement these rules and part 632 of the act.

(7) Subject to subrule (9) of this rule, the department shall approve a mining permit if it determines both of the following:

(a) The permit application meets the requirements of part 632 of the act.

(b) The proposed mining operation will not pollute, impair, or destroy the air, water, or other natural resources or the public trust in those resources, in accordance with part 17 of the act. In making this determination, the department shall consider the extent to which other permit determinations afford protection to natural resources. For this subdivision, excavation and removal of nonferrous metallic minerals and of associated overburden and waste rock, in and of itself, does not constitute pollution, impairment, or destruction of those natural resources.

(8) The department shall deny a mining permit if it determines the requirements of subrule (7) of this rule have not been met.

(9) The department shall not issue a mining permit, or approve a transfer of a mining permit, to a person if the department has determined that person to be in violation of part 632 of the act, these rules, a mining permit, or an order of the department under part 632 of the act, unless the person has corrected the violation or the person has entered into a written consent agreement to correct the violation pursuant to a compliance schedule approved by the department. The department may require compliance with the consent agreement as a condition of the mining permit.

Part 2

Mining specialist

R 425.202 Environmental impact assessment

Rule 202
(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through

all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(i) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(p) Residential dwellings, places of business, places of worship, schools, hospitals, government buildings, or other buildings used for human occupancy all or part of the year

(q) Existing and proposed infrastructure and utilities.

(x) Land uses, land access, general size and shape of tracts of land, and current and historic land use trends.

(gg) Meteorology, and predicted seasonal and long-term variations of the meteorology.

(hh) Visual resources.

(ii) Noise.

(jj) Light.

(kk) Seismicity.

(3) For the conditions and features listed in subrule (2)(d), (e), (g), and (gg) of this rule, the required characterization of seasonal or long-term variations in the condition or feature shall be satisfied by a combination of documented observations of pertinent data over a period of at least 2 years at the monitoring site and records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources. Seasonal and long-term variations at the monitoring site shall be predicted, where feasible, using statistical analysis demonstrating a confidence interval. The statistical analysis shall include an explanation of how the use of any data from other sites affects the confidence interval. Analysis of potential impacts shall incorporate credible extremes in the condition or feature based on the statistical analysis.

(4) An applicant may describe the types of public input sought, if any, in preparing the environmental impact assessment, and may include the method used to collect public input and a summary of relevant comments.

(5) Information required by rules promulgated under another part of the act or under other state or federal law and incorporated in the environmental impact assessment shall satisfy the requirements for an environmental impact assessment under these rules to the extent that the information addresses the area and activities as required under part 632 of the act. (4) An applicant may describe the types of public input sought, if any, in preparing the environmental impact assessment, and may include the method used to collect public input and a summary of relevant comments.

R 425.203 Mining Plan.

Rule 203

Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification

organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected operating life of the mine, and the anticipated rate and schedule of mining.

(b) An estimate of the number of employees required for the mining operation, and variations in the number over the life of the mine.
(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(i) Area, thickness, and characteristics of topsoil that will be stripped, and plans for stockpiling and stabilizing topsoil until it will be used in reclamation.

(ii) Area, volumes, and characteristics of overburden and waste rock to be excavated; plans and schedules for excavating; and locations and dimensions of stockpiles and final placement areas.

(iii) Area, volumes, types, and mineralogy of ore to be excavated, and schedule of mining and stockpiling ore.

(iv) Plans for limiting access to stockpiles and storage or disposal facilities to prevent disposal of unauthorized materials.

(xiv) Storage areas for equipment and vehicles.

(xv) Buildings and other facilities or structures.

(xvi) Areas for the storage and transfer of chemicals, fuel, and explosives.

(xvii) Truck and mining equipment wash down areas.

(xviii) Roads, railroads, docks, piers, and other transportation infrastructure, and provisions to prevent release of contaminants to the environment from ore or waste rock during transportation.
(xix) Beneficiation processes, materials, and activities, including the following:

(A) The types, extent, and sequence of beneficiation, including physical

and chemical characterization of all materials, wastes, or products.

(B) A description of any mills, concentrators, dryers, separators, chemical reactors, filtering equipment, electrolytic chambers, flotation cells, kilns, or other beneficiation equipment.

(C) The type and amount of chemicals to be added.

(D) The types, amounts, locations, sequence, schedule, and means of waste provided.

(E) Provisions to prevent release of contaminants to the environment from beneficiation equipment.

(F) Tailings transport systems, if not buried, should be designed to provide for emergency tailings conveyance or storage should a pipeline break, plug, freeze or require repairs and be made accessible for inspection, emergency repair, and maintenance. Location of emergency spill areas shall be designed to prevent contamination of surface water. If a power failure occurs, then tailing pipelines shall be self draining to the tailings area or to an emergency spill area or standby pumps and pipelines or standby power shall be provided. In some cases (such as a long pipeline over rough country), several spill areas may have to be rock and tailings disposal.

(xxii) A soil erosion and sedimentation control plan that meets the standards of part 91 of the act to effectively reduce accelerated soil erosion and sedimentation that may impact the affected area. The plan shall include, but not be limited to, all of the following:

(A) The location, description, and schedule for installing and removing all proposed temporary soil erosion and sediment control measures.

(B) A description and the location of all proposed permanent soil erosion and sediment control measures, and provisions for establishing the permanent soil erosion control measures as soon as possible after an earth change has been completed or if significant earth change activity ceases.

(C) Provisions to limit the exposed area of any disturbed land to the shortest feasible period of time.

(D) Provisions to remove sediment caused by accelerated soil erosion from runoff water before it leaves the mining area.

(E) Temporary or permanent control measures for the conveyance of

water around, through, or from the area affected by mining activities to limit the water flow to a nonerosive velocity.

(F) Provisions for temporary soil erosion and sedimentation control measures before or upon commencement of the earth change activity; for maintaining the measures on a daily basis; and for removing the measures after permanent soil erosion measures are in place and the area is stabilized.
(G) Provisions for stabilizing the area with permanent soil erosion control measures as soon as possible after an earth change has been completed or if significant earth change activity ceases.

(xxiii) Plans for conducting reclamation activities concurrently with mining operations to the extent feasible.

(xxiv) Plans for inspecting, monitoring, and maintaining liners, final covers, leachate collection systems, leak detection systems, berms, and embankments, including frequency of inspections. Inspecting or monitoring shall be conducted at least monthly.

(d) A map and description of ownership of all tracts of land in the mining area and within 1320 feet of the boundary of the mining area, including all of the following:

(i) Ownership of surface rights.

(ii) Ownership of mineral rights.

(iii) Conservation easements as defined in section 2140 of the act.

(iv) Historic preservation easements as defined in section 2140 of the act.

(e) A description of measures to be taken to prevent damage to property not owned or controlled by the operator within and immediately adjacent to the mining area.

(m) A plan and schedule for inspection or monitoring, or both, of all mine related facilities at least monthly.

(n) The name and qualifications of the person or persons who prepared the plan for the proposed mining operations.

R 425.204 Reclamation Plan.

Rule 204
Rule 204. The mining, reclamation, and environmental protection plan

required under R 425.201(1)(d) shall contain a plan for the proposed final reclamation operations, including the anticipated schedule, sequence, and duration of reclamation. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be used are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) Information depicting and describing the items listed in paragraphs (i) to (iv) of this subdivision. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, documents, and engineering drawings.

(i) Final land contours.

(ii) Proposed final land use and relationship to surrounding land and land use.

(iii) Ponds, streams, wetlands, roads, dikes, drainage ditches, and soil erosion and sedimentation control structures that will remain after completion of reclamation.

(iv) Plans and schedules for stabilizing waste rock piles, settling ponds, tailings disposal facilities, overburden banks, open pit banks and walls, roads, and the plant site. The plans shall include sloping, grading, terracing, and revegetating that will prevent slumping, land or rock slides, or other slope failure and will effectively reduce accelerated soil erosion and sedimentation. The plans shall include the following:

(A) Provisions for sloping or terracing of the banks or bottoms of open pit surfaces that will be under water after cessation of mining, or other measures to prevent a hazard to public safety.

(B) Provisions for replacing topsoil from surface areas disturbed by the mining operation as appropriate for the approved final land use.

(C) Vegetation species and quantities, seedbed and planting area preparation, seeding and planting methods, mulching, fertilization,

maintenance, and final density of plants.

(b) Evidence satisfactory to the department that the proposed reclamation will conform to the following minimum performance standards:

(i) Final disposition of all toxic and hazardous wastes, refuse, tailings and other solid waste shall be managed in a manner that protects the environment, natural resources and public health and safety, and in conformance with all other applicable federal and state laws and regulations.

(iii) All surface structures, infrastructure, rock stockpiles, and tailings disposal areas constructed as a part of the mining activities shall be removed, unless they are converted to an alternate use in accordance with the proposed final land use.

(iv) All disturbed surface areas shall be stabilized to prevent accelerated erosion by wind or water.

(v) All disturbed surface areas shall be revegetated with a variety of plants that are native to the area, except that non-native plants may be used for revegetation in areas where appropriate for an approved final land use that is different from the premining land use. In addition, plant species not native to the area may be used as approved by the department when necessary to provide temporary stabilization of slopes and prevention of erosion.

(vi) Both the mining area and the affected area shall be reclaimed to achieve a self-sustaining ecosystem appropriate for the region that does not require perpetual care following closure and with the goal that the affected area shall be returned to the ecological conditions that approximate premining conditions subject to changes caused by nonmining activities or other natural events. Any portion of the mining area owned by the applicant may be used for any legal purpose.

(c) Plans for monitoring of ground and surface water quality during the postclosure monitoring period.

(d) The name and qualifications of the person or persons who prepared the plan returned to the ecological conditions that approximate premining conditions.

R 425.409 Treatment and containment of reactive materials.

(d) A permittee shall conduct and maintain grading or diking at stockpiles and storage or disposal facilities subject to this rule to assure

that surface water drains away from the storage or disposal area.

R 425.301 Financial assurance; requirements.

Rule 301. (1) A mining permit shall not be effective until the permittee establishes financial assurance in an amount in accordance with the mining permit as issued and in compliance with this rule. A permittee shall thereafter maintain financial assurance that is approved by the department during mining operations and during the postclosure monitoring period, until the department releases the permittee from its obligation to maintain financial assurance upon termination of the mining permit or upon transfer of the mining permit to another operator. Failure of a permittee to maintain financial assurance after the effective date of a mining permit as required by this subrule constitutes a violation of the mining permit and is grounds for the department to order immediate suspension of any or all mining activities, including the removal of metallic product from the site, pursuant to section 63221 of the act.

(2) The financial assurance shall apply to all mining and reclamation operations subject to the mining permit and shall be sufficient to cover the cost to administer, and to hire a third party to implement the reclamation, remediation, and postclosure monitoring required under part 632 of the act, these rules, a mining permit, or orders of the department under part 632 of the act, including the costs to remediate any contamination of the air, surface water, or groundwater that is in violation of the mining permit. The amount of financial assurance shall be determined as follows:

(a) The operator shall provide an itemized list of reclamation, remediation, and postclosure monitoring activities and costs associated with all of the following:

(i) Mining activities subject to the mining permit where reclamation has not yet been completed.

(ii) Mining activities that are anticipated to occur under the mining permit.

(b) The department may require financial assurance in an amount larger than calculated by the operator under subdivision (a) of this subrule based upon an analysis of the projected costs under subdivision (c) of this subrule by the department.

(c) The cost estimate required under this subrule shall be based on equipment, materials, and methods normally available to a third party contractor using current handbooks, publications, or other documented costs acceptable to the department. The cost estimate shall include at a minimum the costs for the following:

(i) Reclamation.

(ii) Remediation of any contamination of the air, surface water, or groundwater that is in violation of the mining permit.

(iii) Administrative oversight.

(iv) Reasonable contingencies.

(v) Other necessary environmental protection measures.

(d) The amount of an assurance instrument shall include any possible fees assessed by the issuing institution for accessing the instrument.

(3) The financial assurance required under this rule shall consist of an assurance instrument or combination of instruments covering at least 75% of the total required amount. Financial assurance for the balance of the required amount, if any, shall consist of a statement of financial responsibility. When determining the portion of the financial assurance required under this rule that may be satisfied by a statement of financial responsibility, the department shall consider the following:

(a) The ability of the operator to pay for potential remediation costs in the case of a violation of this part, as demonstrated by the information in the statement of financial responsibility.

(b) Whether the operator carries pollution prevention or environmental liability insurance, and if so, the amount of the insurance.

(c) Whether the operator has received a recognized third-party certification of an environmental management system for mining operations.

Hydrogeologist/Geologist

R 425.202 Environmental impact assessment.

Rule 202
(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(ii) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate

and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(a) Topography.

(b) Soil series.

(c) Geology of the bedrock and unconsolidated materials overlying the bedrock,
including areal extent, thickness, lithology, and permeability.

(d) Groundwater occurrence that may impact, or be impacted by, mining activities, including the following:

(i) Thicknesses of aquifers, hydraulic conductivity, and interconnections between multiple aquifers and between aquifers and surface water.

(ii) Depth to groundwater, groundwater recharge areas, groundwater flow direction, hydraulic gradients, groundwater velocity, and 3-dimensional flow paths.

(iii) Seasonal variations of the items in paragraph (ii) of this subdivision.

(e) Natural or artificial lakes, ponds, impoundments, rivers, streams, creeks, drains, seeps, and springs, including both of the following:

(i) Observed levels or discharge rates.

(ii) Predicted seasonal and long-term variations of levels or discharge rates.

(f) A complete water balance that accounts for precipitation, evapotranspiration, infiltration, runoff, streamflows, and groundwater and surface water withdrawals and discharges from mining activities.

(i) All documented private water supply wells.

(j) All public water supply wells.

(k) Irrigation and disposal wells.

(l) Designated wellhead protection areas.

(3) For the conditions and features listed in subrule (2)(d), (e), (g), and (gg) of this rule, the required characterization of seasonal or long-term variations in the condition or feature shall be satisfied by a combination of documented observations of pertinent data over a period of at least 2 years at the monitoring site and records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources. Seasonal and long-term variations at the monitoring site shall be predicted, where feasible, using statistical analysis demonstrating a confidence interval. The statistical analysis shall include an explanation of how the use of any data from other sites affects the confidence interval. Analysis of potential impacts shall incorporate credible extremes in the condition or feature based on the statistical analysis.

(5) Information required by rules promulgated under another part of the act or under other state or federal law and incorporated in the environmental impact assessment shall satisfy the requirements for an environmental impact assessment under these rules to the extent that the information addresses the area and activities as required under part 632 of the act.

R 425.203 Mining Plan.

Rule 203

Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected operating life of the mine, and the anticipated rate and schedule of mining.

(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear

depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(f) Measures to minimize impacts to the volumes and rates of recharge, flow, and discharge of groundwater and surface waters in the mining area and in the affected area sufficient to accommodate seasonal and long-term variations in precipitation, water quantity, and water quality.

(g) A monitoring plan for monitoring of groundwater and surface water quality, groundwater levels, and surface water stage and discharge rates, during mining operations and during the post-closure monitoring period. The monitoring plan shall conform to existing statutes and rules, but is not required to include monitoring required under other permits.

(i) The monitoring plan shall provide for monitor wells and structures to be located at points where mining activities have a reasonable potential for measurable impact on surface water or groundwater, taking into consideration the following:

(A) Proximity to the mining activity.

(B) The potential for diffusion and dispersion.

(C) Horizontal and vertical groundwater gradients.

(D) Seasonal variations in flow.

(E) Topography, access, and other practical limitations.

(ii) The monitoring plan shall comply with the requirements of R 425.406.

(iii) The monitoring plan shall include all of the following:

(A) Number and location of monitoring wells and structures.

(B) Frequency of sampling and sampling procedure, including all of the following:

(aa) The sampling method and volume of water to be removed from each well or sampling point during sampling.

(bb) Steps taken to prevent cross contamination between samples.

(cc) Sample handling and preservation methods.

(dd) Laboratory analysis method.

(ee) Laboratory method detection level.

(ff) Quality assurance and quality control as approved by the department.

(gg) Provisions for routine monitoring to be conducted at least every 3 months.

(C) Sampling parameters, which shall include the following:

(aa) Specific conductance.

(bb) Temperature.

(cc) The hydrogen ion concentration expressed as pH.

(dd) Dissolved oxygen.

(ee) Concentrations of calcium, sodium, magnesium, potassium, and iron.

(ff) Concentrations of chloride, sulfate, and bicarbonate.

(gg) Concentrations of other total and dissolved elements and compounds that may be introduced or affected by the mining activities, as identified in the environmental impact assessment.

(D) A description of the techniques used to present and evaluate water quality monitoring data.

(E) A description of the method used to collect static water levels and present groundwater flow data. Static water level precision shall be to 0.01 foot.

(F) The depth and screened interval for each monitor well.

(G) Provisions for design, construction, and abandonment of monitoring wells and structures that comply with R 425.406(2).

R 425.406 Protection of water.

Rule 406. (1) A permittee shall conduct groundwater and surface water monitoring according to the approved monitoring plan as described in R 425.203(g) during mining operations and during the postclosure

monitoring period.
(2) An operator shall design, construct, and abandon a monitoring well as prescribed in R 323.2223(4).

(3) Water monitoring shall include the collection of water quality samples from groundwater and surface water, groundwater levels, and surface water levels and discharge rates. The design of the water monitoring systems shall be based on all of the following:

(a) The environmental impact assessment.

(b) The local geology and hydrology.

(c) Groundwater and surface water conditions specific to each activity.

(4) Surface water monitoring sites shall be designed and located to adequately assess the impact of a specific mining activity on surface water.

(5) Groundwater monitoring sites shall be designed and located as follows:

(a) Leachate monitoring wells shall be located within, or as close as physically practicable to, a storage or disposal facility for the following materials that are determined to be reactive, to determine the geochemical conditions of the facility.:

(i) Overburden.

(ii) Ore.

(iii) Waste rock.

(iv) Tailings.

(b) Compliance monitoring wells shall be located as close as physically practicable but not more than 150 feet from the mining activity being monitored. However, the department may approve an alternative water monitoring location if the operator demonstrates the location is protective of the environment and public health and safety, and a closer location is not feasible or effective.

Water quality specialist

R 425.202 Environmental impact assessment.

Rule 202
(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(iii) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(g) Groundwater and surface water quality, including all of the following:

(i) Specific conductance as an indication of dissolved solids.

(ii) Temperature.
(iii) The hydrogen ion concentration expressed as pH.

(iv) Dissolved oxygen.

(v) Concentrations of all of the following substances:

(A) Cations of calcium, sodium, magnesium, potassium, and iron.

(B) Anions of chloride, sulfate, and bicarbonate.

(C) Other total and dissolved elements and compounds that may be introduced or affected by the mining activities.

(vi) Predicted seasonal variations of the parameters listed in paragraphs (i) to (v) of this subdivision.

(3) For the conditions and features listed in subrule (2)(d), (e), (g), and (gg) of this rule, the required characterization of seasonal or long-term variations in the condition or feature shall be satisfied by a combination of documented observations of pertinent data over a period of at least 2 years at the monitoring site and records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources. Seasonal and long-term variations at the

monitoring site shall be predicted, where feasible, using statistical analysis demonstrating a confidence interval. The statistical analysis shall include an explanation of how the use of any data from other sites affects the confidence interval. Analysis of potential impacts shall incorporate credible extremes in the condition or feature based on the statistical analysis.

(5) Information required by rules promulgated under another part of the act or under other state or federal law and incorporated in the environmental impact assessment shall satisfy the requirements for an environmental impact assessment under these rules to the extent that the information addresses the area and activities as required under part 632 of the act.

R 425.203 Mining Plan.

Rule 203

Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected operating life of the mine, and the anticipated rate and schedule of mining.

(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(g) A monitoring plan for monitoring of groundwater and surface water quality, groundwater levels, and surface water stage and discharge rates, during mining operations and during the post-closure monitoring period. The monitoring plan shall conform to existing statutes and rules, but is not

required to include monitoring required under other permits.

(i) The monitoring plan shall provide for monitor wells and structures to be located at points where mining activities have a reasonable potential for measurable impact on surface water or groundwater, taking into consideration the following:

(A) Proximity to the mining activity.

(B) The potential for diffusion and dispersion.

(C) Horizontal and vertical groundwater gradients.

(D) Seasonal variations in flow.

(E) Topography, access, and other practical limitations.

(ii) The monitoring plan shall comply with the requirements of R 425.406.

(iii) The monitoring plan shall include all of the following:

(A) Number and location of monitoring wells and structures.

(B) Frequency of sampling and sampling procedure, including all of the following:

(aa) The sampling method and volume of water to be removed from each well or sampling point during sampling.

(bb) Steps taken to prevent cross contamination between samples.

(cc) Sample handling and preservation methods.

(dd) Laboratory analysis method.
(ee) Laboratory method detection level.

(ff) Quality assurance and quality control as approved by the department.

(gg) Provisions for routine monitoring to be conducted at least every 3 months.

(C) Sampling parameters, which shall include the following:

(aa) Specific conductance.

(bb) Temperature.

(cc) The hydrogen ion concentration expressed as pH.

(dd) Dissolved oxygen.

(ee) Concentrations of calcium, sodium, magnesium, potassium, and iron.

(ff) Concentrations of chloride, sulfate, and bicarbonate.

(gg) Concentrations of other total and dissolved elements and compounds that may be introduced or affected by the mining activities, as identified in the environmental impact assessment.

(D) A description of the techniques used to present and evaluate water quality monitoring data.

(E) A description of the method used to collect static water levels and present groundwater flow data. Static water level precision shall be to 0.01 foot.

(F) The depth and screened interval for each monitor well.

(G) Provisions for design, construction, and abandonment of monitoring wells and structures that comply with R 425.406(2).

R 425.406 Protection of water.

Rule 406
(1) A permittee shall conduct groundwater and surface water monitoring according to the approved monitoring plan as described in R 425.203(g) during mining operations and during the postclosure monitoring period.

(2) An operator shall design, construct, and abandon a monitoring well as prescribed in R 323.2223(4).

(3) Water monitoring shall include the collection of water quality samples from groundwater and surface water, groundwater levels, and surface water levels and discharge rates. The design of the water monitoring systems shall be based on all of the following:

(a) The environmental impact assessment.

(b) The local geology and hydrology.

(c) Groundwater and surface water conditions specific to each activity.

(4) Surface water monitoring sites shall be designed and located to adequately assess the impact of a specific mining activity on surface water.

(5) Groundwater monitoring sites shall be designed and located as follows:

(a) Leachate monitoring wells shall be located within, or as close as physically practicable to, a storage or disposal facility for the following materials that are determined to be reactive, to determine the geochemical conditions of the facility.:

(i) Overburden.

(ii) Ore.

(iii) Waste rock.

(iv) Tailings.

(b) Compliance monitoring wells shall be located as close as physically practicable but not more than 150 feet from the mining activity being monitored. However, the department may approve an alternative water monitoring location if the operator demonstrates the location is protective of the environment and public health and safety, and a closer location is not feasible or effective.

Waste water engineer

R 425.203 Mining Plan

Rule 203
Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected operating life of the mine, and the anticipated rate and schedule of mining.

(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(xii) A description of water that will be used in the mining operations, including the source or sources of the water and intended rates and durations of pumping, diversion, or withdrawal.

(xiii) A description of water that will be stored, transferred, or discharged in the mining operations, including:

(A) The location, size, and capacities of any artificial ponds, impoundments, dewatering systems, diversions, other water control structures, and treatment facilities.

(B) The estimated volumes, rates, and water quality of discharges, and the discharge locations.

WHMD Engineer (Slurry Wall)

R 425.203 Mining Plan

Rule 203
Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected

operating life of the mine, and the anticipated rate and schedule of mining.

(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(xx) Plans and schedules for regulating or controlling drainage of water, including surface runoff, from within the diked area of a tailings disposal area to prevent breaching of the dikes, both during and after mining. The plans and schedules shall ensure that 24-hour 100-year precipitation events do not cause releases of water that are not in compliance with the conditions of the mining permit.

RRD Part 201 Specialist

R 425.203 Environmental impact assessment

(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the

affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(iv) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(h) Any known occurrence of groundwater that is contaminated so that a property is a facility as defined by part 201 of the act.

LWMD District Representative

R 425.203 Environmental impact assessment

Rule 202

(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(v) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(m) Floodplains, Great Lake shorelines, and wetlands.

(n) Natural rivers as defined in section 30501 of the act.

(o) Wild and scenic rivers as defined in 1968, Public Law 90-542, 82 Stat. 906.

(vi) Predicted seasonal variations of the parameters listed in paragraphs (i) to (v) of this subdivision.

(3) For the conditions and features listed in subrule (2)(d), (e), (g), and (gg) of this rule, the required characterization of seasonal or long-term variations in the condition or feature shall be satisfied by a combination of documented observations of pertinent data over a period of at least 2 years at the monitoring site and records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources. Seasonal and long-term variations at the monitoring site shall be predicted, where feasible, using statistical analysis demonstrating a confidence interval. The statistical analysis shall include an explanation of how the use of any data from other sites affects the confidence interval. Analysis of potential impacts shall incorporate credible extremes in the condition or feature based on the statistical analysis.

(5) Information required by rules promulgated under another part of the act or under other state or federal law and incorporated in the environmental impact assessment shall satisfy the requirements for an environmental impact assessment under these rules to the extent that the information addresses the area and activities as required under part 632 of the act.

DNR Wildlife Biologist

R 425.203 Environmental impact assessment

Rule 202
(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(vi) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(y) Species and abundance of aquatic and terrestrial flora and fauna, and predicted variations in their occurrence based on at least 2 years of relevant information. Relevant information may include records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources, but shall include at least 1 year of site-specific data.

(z) Fish and wildlife habitats.

(aa) Threatened species or endangered species as defined in part 365 of the act or in the endangered species act of 1973, Public Law 93-205, 87 Stat. 884.

(bb) Species of special concern as designated by the US forest service region 9 regional forester's list of species of special concern.

(cc) Non-native or invasive plant and animal species.

(dd) Ecological systems as identified in recognized published sources.

(vi) Predicted seasonal variations of the parameters listed in paragraphs (i) to (v) of this subdivision.

(3) For the conditions and features listed in subrule (2)(d), (e), (g), and (gg) of this rule, the required characterization of seasonal or long-term variations in the condition or feature shall be satisfied by a combination of documented observations of pertinent data over a period of at least 2 years at the monitoring site and records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources. Seasonal and long-term variations at the monitoring site shall be predicted, where feasible, using statistical analysis demonstrating a confidence interval. The statistical analysis shall include an explanation of how the use of any data from other sites affects the confidence interval. Analysis of potential impacts shall incorporate credible extremes in the condition or feature based on the statistical analysis.

(5) Information required by rules promulgated under another part of the act or under other state or federal law and incorporated in the environmental impact assessment shall satisfy the requirements for an environmental impact assessment under these rules to the extent that the information addresses the area and activities as required under part 632 of the act.

R 425.203 Mining Plan

Rule 203

Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected operating life of the mine, and the anticipated rate and schedule of mining.

(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other

required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(j) If a threatened or endangered species may be impacted, a plan to protect the threatened or endangered species that conforms to the requirements of state and federal endangered species laws.

(k) Plans to monitor, prevent, minimize, and mitigate any adverse impacts of the proposed mining operation on flora, fauna, fish or wildlife habitats, and biodiversity.

DNR Fisheries Biologist

R 425.203 Environmental impact assessment

Rule 202
(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through

all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(vii) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(y) Species and abundance of aquatic and terrestrial flora and fauna, and predicted variations in their occurrence based on at least 2 years of relevant information. Relevant information may include records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources, but shall include at least 1 year of site-specific data.

(z) Fish and wildlife habitats.

(aa) Threatened species or endangered species as defined in part 365 of the act or in the endangered species act of 1973, Public Law 93-205, 87 Stat. 884.

(bb) Species of special concern as designated by the US forest service region 9 regional forester's list of species of special concern.

(cc) Non-native or invasive plant and animal species.

(dd) Ecological systems as identified in recognized published sources.

(vi) Predicted seasonal variations of the parameters listed in paragraphs (i) to (v) of this subdivision.

(3) For the conditions and features listed in subrule (2)(d), (e), (g), and (gg) of this rule, the required characterization of seasonal or long-term variations in the condition or feature shall be satisfied by a combination of documented observations of pertinent data over a period of at least 2 years at the monitoring site and records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources. Seasonal and long-term variations at the monitoring site shall be predicted, where feasible, using statistical analysis demonstrating a confidence interval. The statistical analysis shall include an explanation of how the use of any data from other sites affects the confidence interval. Analysis of potential impacts shall incorporate credible extremes in the condition or feature based on the statistical analysis.

(5) Information required by rules promulgated under another part of the act or under other state or federal law and incorporated in the environmental impact assessment shall satisfy the requirements for an environmental impact assessment under these rules to the extent that the information addresses the area and activities as required under part 632 of the act.

R 425.203 Mining Plan

Rule 203

Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected operating life of the mine, and the anticipated rate and schedule of mining.

(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(j) If a threatened or endangered species may be impacted, a plan to protect the threatened or endangered species that conforms to the requirements of state and federal endangered species laws.

(k) Plans to monitor, prevent, minimize, and mitigate any adverse impacts of the proposed mining operation on flora, fauna, fish or wildlife habitats, and biodiversity.

DNR Forester

R 425.203 Environmental impact assessment

Rule 202
(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the

environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through all processes or mechanisms. The analysis shall consider additive effects, and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(viii) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(r) Areas actively maintained for public recreation.

(s) Natural areas as defined in R 324.35101.

(t) State wilderness areas as defined in MCL 324.35101.

(u) Federal wilderness areas as defined in 78 Stat. 890, 16 U.S.C. 1131.

(v) Wild areas as defined in MCL 324.35101.

(w) Research natural areas as defined in CFR Title 36, Section 251.23.

AQD Engineer

R 425.203 Environmental impact assessment

Rule 202
(1) The environmental impact assessment required under R 425.201(1)(c) shall include, but is not limited to, the following:

(a) For each of the conditions and features listed in subrule (2) of this rule:
(i) An identification and description of the condition or feature as it currently exists within the mining area and the affected area.

(ii) An identification of the proposed mining activities that may impact the condition or feature, and the process or mechanism through which the impact may occur.

(iii) An analysis of the potential impacts of proposed mining activities on the condition or feature and, where applicable, the effects of the condition or feature on the proposed mining activities.

(iv) A reference to the measures proposed to be taken under the mining, reclamation, and environmental protection plan to reduce or mitigate the potential impacts, and the predicted effects of those measures. If the measures are not required under part 632 of the act, then the environmental impact assessment shall identify other statutes or regulations, if any, under which the measures are required.

(v) A map or maps and appropriate photographs, with any necessary explanatory documents or notations, showing the affected area for the condition or feature, and a description of the basis for determining the affected area.

(b) An analysis of the potential cumulative impacts on each of the conditions or features listed in subrule (2) of this rule within the mining area and the affected area from all proposed mining activities and through all processes or mechanisms. The analysis shall consider additive effects,

and the assessment of significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released.

(c) An analysis of feasible and prudent alternatives for the mining activities consistent with the reasonable requirements of the public health, safety, and welfare. The analysis shall include all of the following:

(i) A description of feasible and prudent alternatives.

(ii) A description of alternatives considered but not carried forward for further evaluation.

(iii) A description of why the chosen alternatives are preferred.

(e) A description of the methodologies applied in preparing the environmental impact assessment, including the following:

(ix) Quality assurance and quality control as approved by the department.

(ii) Information that demonstrates that the methodologies are appropriate and effective, or are widely used and generally accepted.

(f) The sources of information used in preparing the environmental impact assessment.

(2) The requirements of subrule (1)(a) and (b) of this rule apply to natural and humanmade conditions and features including, but not limited to, the following:

(ff) Air quality.

(vi) Predicted seasonal variations of the parameters listed in paragraphs (i) to (v) of this subdivision.

(3) For the conditions and features listed in subrule (2)(d), (e), (g), and (gg) of this rule, the required characterization of seasonal or long-term variations in the condition or feature shall be satisfied by a combination of documented observations of pertinent data over a period of at least 2 years at the monitoring site and records of pertinent data at other sites having documented similar conditions or credible regional studies from acknowledged sources. Seasonal and long-term variations at the monitoring site shall be predicted, where feasible, using statistical analysis demonstrating a confidence interval. The statistical analysis shall include an explanation of how the use of any data from other sites affects the

confidence interval. Analysis of potential impacts shall incorporate credible extremes in the condition or feature based on the statistical analysis.

(5) Information required by rules promulgated under another part of the act or under other state or federal law and incorporated in the environmental impact assessment shall satisfy the requirements for an environmental impact assessment under these rules to the extent that the information addresses the area and activities as required under part 632 of the act.

Mine pit limnologist

R 425.203 Mining Plan

Rule 203

Rule 203. The mining, reclamation, and environmental protection plan required under R 201(1)(d) shall contain a plan for the proposed mining operations. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) A description of the type and method of mining, the expected operating life of the mine, and the anticipated rate and schedule of mining.

(c) Information depicting and describing the items listed in paragraphs (i) to (xxiv) of this subdivision that are mining activities or are part of, or associated with, mining activities. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government-surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, photographs, documents, and engineering drawings.

(v) A characterization of the geochemistry of the ore, waste rock, and overburden that will be mined, and peripheral rock that will be exposed in the process of mining, and of any tailings that will be generated. The characterization shall include the following:

(A) Chemical and physical testing and modeling to predict the potential generation of acid, dissolved metals, and other related substances by reaction and leaching of the ore, waste rock, tailings, overburden, and peripheral rock.

(B) Testing and modeling methodology.

(C) A plan for monitoring the characterization during the proposed mining that are reactive.

(D) Identification of the ore, waste rock, overburden, peripheral rock, and tailings operation to calibrate and adjust the model and predictions.

(vii) The locations, depths, and contours of open pits.

(c)(xix)(C) The type and amount of chemicals to be added.

(c)(xix)(D) The types, amounts, locations, sequence, schedule, and means of waste rock and tailings disposal.

(xxi) Plans and schedules for monitoring, containment, and treatment of surface runoff that has contacted, or may contact, ore, waste rock, overburden, or tailings determined to be reactive under R 425.203(c)(v). The plans shall be designed to reasonably minimize actual and potential adverse impacts on groundwater and surface water by preventing leaching or runoff of acid-forming waste products and other waste products from the mining process.

(h) A treatment and containment plan that describes proposed measures to prevent contamination of groundwater and surface water from leaching of acidic water or dissolved metals.

(i) The treatment and containment plan required under this subdivision shall apply to earth materials that are determined to be reactive under R 425.203(c)(v). The plan shall describe proposed measures for the following:

(A) Design, construction, and operation of stockpiles and storage or disposal facilities for ore, waste rock, overburden, and tailings.

(B) The management of peripheral rock that has been determined in the environmental impact assessment to have the potential to contaminate groundwater or surface water.

(ii) The treatment and containment plan required under this subdivision shall account for the volume, rate, and movement of leachate that may be

generated, and the influence of weather on the generation of leachate, including any adverse impacts from severe or extreme weather events.

(iii) The treatment and containment plan required under this subdivision shall meet all applicable requirements of R 425.409.

R 425.204 Reclamation Plan

Rule 204. The mining, reclamation, and environmental protection plan required under R 425.201(1)(d) shall contain a plan for the proposed final reclamation operations, including the anticipated schedule, sequence, and duration of reclamation. The plan shall include information that demonstrates that all methods, materials, and techniques proposed to be used are capable of accomplishing their stated objectives in protecting the environment and public health, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The required information may consist of results of actual testing, modeling, documentation by credible independent testing and certification organizations, or documented applications in similar uses and settings. The plan shall include, at a minimum, all of the following:

(a) Information depicting and describing the items listed in paragraphs (i) to (iv) of this subdivision. Information that is amenable to clear depiction on a map shall be shown on a map or maps of the mining area drawn to an appropriate scale on a topographic base and referenced to the nearest government surveyed section or quarter-section lines. Other required information shall be presented, as appropriate, by cross-sections, documents, and engineering drawings.

(i) Final disposition of all toxic and hazardous wastes, refuse, tailings and other solid waste shall be managed in a manner that protects the environment, natural resources and public health and safety, and in conformance with all other applicable federal and state laws and regulations.

R 425.406 Protection of water.

Rule 406. (1) A permittee shall conduct groundwater and surface water monitoring according to the approved monitoring plan as described in R 425.203(g) during mining operations and during the postclosure monitoring period.

(2) An operator shall design, construct, and abandon a monitoring well as prescribed in R 323.2223(4).

(3) Water monitoring shall include the collection of water quality samples from groundwater and surface water, groundwater levels, and surface water levels and discharge rates. The design of the water monitoring systems shall be based on all of the following:

(a) The environmental impact assessment.

(b) The local geology and hydrology.

(c) Groundwater and surface water conditions specific to each activity.

(4) Surface water monitoring sites shall be designed and located to adequately assess the impact of a specific mining activity on surface water.

(5) Groundwater monitoring sites shall be designed and located as follows:

(a) Leachate monitoring wells shall be located within, or as close as physically practicable to, a storage or disposal facility for the following materials that are determined to be reactive, to determine the geochemical conditions of the facility.:

(i) Overburden.

(ii) Ore.

(iii) Waste rock.

(iv) Tailings.

R 425.409 Treatment and containment of reactive materials.

Rule 409. An operator shall manage overburden, ore, waste rock, peripheral rock, and tailings determined to be reactive under R 425.203(c)(v) in accordance with this rule and in a manner that is designed to reasonably minimize actual and potential adverse impacts on groundwater and surface water by preventing leaching or runoff of acid-forming waste products and other waste products from the mining process.

(a) An operator shall design, construct, and operate stockpiles or storage facilities for reactive overburden, ore, waste rock, or tailings in compliance with paragraph (i) or (ii) of this subdivision.

(i) A stockpile or storage facility shall meet the following requirements:

(A) A stockpile or storage facility shall have a composite liner system comprised of a flexible synthetic membrane that is not less than 60 mils thick and a layer of at least 3 feet of compacted soil having a maximum hydraulic conductivity of 1.0 X 10-7 cm/sec.

(B) The department may approve an alternative liner system that uses other materials or designs, including modified soil liners, or technologically advanced systems only if the operator provides data to demonstrate the alternative is capable of providing equivalent or better protection as compared to the requirements under subparagraph (A).

(D) A stockpile or storage facility shall have a leak detection system.

(E) The liner, leachate collection system, and leak detection system shall be tested before the placement of overburden, ore, waste rock, or tailings into the facility.

(ii) Subject to approval of the department, an operator may utilize an alternative plan for a stockpile or storage facility for reactive overburden, ore, waste rock, or tailings. The department may approve an alternative plan only if the operator provides data that demonstrates that the alternative plan is capable of providing protection of groundwater and surface water that is equivalent to or better than that provided under paragraph (i) of this subdivision. The alternative plan shall incorporate 1 or more of the following:

(A) Measures to prevent the generation of leachate by adding a material or materials that counteract or neutralize the acid-forming or toxic characteristics of the ore, waste rock, overburden, or tailings.

(B) Measures to treat or neutralize any leachate that may be generated before it migrates outside of the storage facility.

(C) Measures to isolate the ore, waste rock, overburden, or tailings from oxygen and other oxidizing substances.

(D) Measures to isolate the ore, waste rock, overburden, or tailings from groundwater or surface water.

(b) An operator may utilize a disposal facility to manage, contain, or isolate reactive waste rock, tailings, overburden, or peripheral rock subject to approval of the department. A disposal facility may consist of a mined area that will be backfilled. The department shall not approve the plans for a disposal facility unless the operator demonstrates that the design, construction, operation, and closure of the disposal facility will reasonably

minimize the actual and potential adverse impacts on groundwater and surface water by preventing leaching or runoff of acid-forming waste products and other waste products from the mining process and will not require perpetual care following closure in accordance with MCL 324.63209(8) and with R 425.204(b)(vi).

(c) A stockpile or storage or disposal facility under this rule shall be monitored in compliance with R 425.406.